REMARKS

Claims 1, 3, 4 and 6-9 are all the claims pending in the present application.

I. Response to Rejections under 35 U.S.C. § 103

Claims 1, 4 and 6-9 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP 2000-029247 to Nakanishi et al. (JP '247) in view of U.S. Pat. No. 5,665,510 to Hattori.

Claim 3 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over JP '247 in view of Hattori, and further in view of U.S. Pat. No. 6,992,150 to Nakanishi et al. (Nakanishi '150).

Applicants respectfully traverse the rejections for the reasons of record and the following additional reasons.

Independent claims 1 and 4 recite, *inter alia*, a polyester resin obtained by reacting the polyester type resin (A2) with the epoxy group containing styrene type resin (B2) and further introducing the polyisocyanate (D2).

As explained on page 19, 5th full paragraph of the present specification, the reaction of the carboxyl group within the polyester type resin (A2) and the epoxy group of the epoxy group containing styrene type resin (B2) first occurs and the hydroxy group generated by this reaction is then further reacted with the polyisocyanate. In this manner, the polyester unit is grafted to the styrene backbone via the epoxy group of the styrene type resin and the polyisocyanate promotes crosslinking.

The present specification further describes the effect by employing the polyisocyanate (D2). Particularly, as the results in Tables 5-1 and 5-2 show, Reference Example 7, which contains a polyester obtained without polyisocyanate

(D2), leads to inferior properties, e.g., offset-resistant and blocking-resistant properties, compared to the resins employing polyisocyanate (D2).

Moreover, the present inventors have found that sometimes the polyester resin (A2) and the epoxy group containing styrene type resin (B2) are not well compatible with each other from the view of realizing the excellent dispersion properties of those resins, which can lead to the excellent blocking resistant properties. It is preferable that the epoxy group containing styrene type resin (B2) is in the state of the microdispersion in the polyester resin (A2) from the view of the stability of the properties of the binder resin for toner.

In particular, when a wax (F2) is employed, it would be difficult for the wax (F2) to become well dispersed in the resin, and as such, the further improvement on the blocking resistant properties may not be achieved (see page 20, lines 24 to 31 of the present specification).

According to the presently claimed invention, the binder resin for toner is produced by using polyisocyanate (D2) (page 19, lines 8 to 4 from the bottom of the present specification), in which the carboxyl group of the polyester resin and an epoxy group of the epoxy group containing styrene type resin (B2) react. It is believed that a part of polyisocyanate (D2) plays a role as assistance of linking the polyester resin (A2) with the epoxy group containing styrene type resin (B2), thereby minimizing the problem on the poor compatibility of the polyester resin (A2) and the epoxy group containing styrene type resin (B2).

JP '247 describes a toner binder which is a combination of a polycondensation resin (A) and other resin (B). The polycondensation resin (A) can be any of a variety of resins set forth in paragraph [0005] which includes polyester,

polyamide, polyurethane, polycarbonate, polyester polyamide, polyester polyurethane, etc. The other resin (B) is described in paragraph [0013] and can again be a variety of different resins, many of which are not styrene type resins. JP '247 does not disclose employing polyisocyanate as an additional component in the composition described therein.

Furthermore, even if a polyester polyurethane is selected as the polycondensation resin (A) and a styrene type resin is selected as the other resin (B), JP '247 still does not satisfy the recitations of present claims 1 and 4. Particularly, in JP '247, the polyester and polyisocyanate are first reacted to form a polyester polyurethane, which is then reacted with the other resin (B), resulting in polyester polyurethane where both of the polyester and styrene residues form the polymer backbone. This polyester polyurethane of JP '247 has a structure different from the polyester resin reacted with polyisocyanate recited in present claims 1 and 4. In other words, the reaction order for preparing the polyester resin recited in present claims 1 and 4 results in a product which is different from that described in JP '247.

Still further, JP '247 is silent on the effects of the polyisocyanata on the blocking resistant properties of the binder resin for toner and compatibility of the polyester resin (A2) and the epoxy group containing styrene type resin (B2), which are obtainable by the presently claimed invention, as discussed above.

In addition, Hattori discloses a binder resin containing a resin having an epoxy group and optionally a conventional binder resin including polystyrene, a styrene-(meth)acrylate copolymer and a polyester (col. 2, lines 61-66). That is, the binder resin of Hattori is a mixture of two resins, one of which is a resin having an epoxy

group. Hattori further describes that such binder resin should have epoxy equivalent of 500 to 20,000 g/eq, to provide sufficient softening point and blocking preventing effect (col. 3, line 66-col. 4, line 8). Hattori does not disclose or suggest that such resin having an epoxy group would still provide desired properties after reacting with a conventional binder resin, such as a polyester.

On the other hand, JP '247 describes reacting a polyester polyurethane, which is formed from a polyester and polyisocyanate, with the other resin (B) which may include a styrene resin. As discussed above, when an epoxy group containing polymer is reacted with polyester, the epoxy groups in the epoxy group containing polymer react with other functional groups and thus are consumed. Therefore, in light of the disclosure of Hattori, one of ordinary skill in the art would not have been motivated to prepare a resin by reacting an epoxy group containing polymer with another polymer, as described in JP '247. In other words, there would have been no motivation to combine Hattori and JP '247.

Applicants note that Hattori discloses that isocyanate can be employed as a curing agent (col. 5, line 50). It is believed that in Hattori, isocyanate (the curing agent) would be reacted with the epoxy group in the resin, and not with polyester/styrene-acrylate copolymer resin. Hattori does not suggest that isocyanate (the curing agent) be reacted with polyester/styrene-acrylate copolymer resin.

Further, Nakanishi '150 is relied upon merely as teaching a polyester resin for toner having specific Tg and thus does not rectify the deficiencies of JP '247 and Hattori. Therefore, even if JP '247, Hattori and Nakanishi '150 are combined, the combination still would not result in the subject matter of claims 1 and 4.

In view of the foregoing, Applicants respectfully submit that claim 1 and 4 are patentable over JP '247 in view of Hattori, and further in view of Nakanishi '150, and thus the rejections should be withdrawn. Additionally, claims 3 and 6-9 depend from claim 1 or 4, and thus are patentable over the cited references at least by virtue of their dependency.

II. Conclusion

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (202) 452-7932 at his earliest convenience.

Respectfully submitted,

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